## General Description

The AGM18N10D combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$ .

This device is ideal for load switch and battery protection applications.

## Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

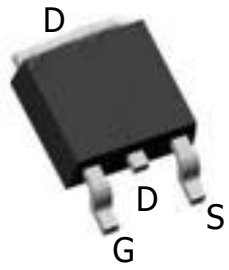
## Application

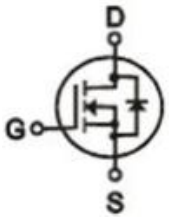
- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

## Product Summary

| BVDSS | RDSON | ID |
|---|---|---|
| 100V | 16mΩ | 40A |

**TO-252 Pin Configuration**




## Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|---|---|---|---|---|---|
| AGM18N10D | AGM18N10D | TO-252 | 330mm | 16mm | 2500 |

**Table 1. Absolute Maximum Ratings (TA=25℃)**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| VDS | Drain-Source Voltage (VGS=0V) | 100 | V |
| VGS | Gate-Source Voltage (VDS=0V) | ±20 | V |
| ID | Drain Current-Continuous(Tc=25℃) **(Note 1)** | 40 | A |
| | Drain Current-Continuous(Tc=100℃) | 32 | A |
| IDM (pluse) | Drain Current-Continuous@ Current-Pulsed **(Note 2)** | 220 | A |
| PD | Maximum Power Dissipation(Tc=25℃) | 30 | w |
| | Maximum Power Dissipation(Tc=100℃) | 12 | w |
| EAS | Avalanche energy **(Note 3)** | 22 | mJ |
| TJ,TSTG | Operating Junction and Storage Temperature Range | -55 To 150 | ℃ |

**Table 2. Thermal Characteristic**

| Symbol | Parameter | Typ | Max | Unit |
|---|---|---|---|---|
| RθJA | Thermal Resistance Junction-ambient (Steady State)[1] | -- | 62 | ℃/W |
| RθJC | Thermal Resistance Junction-Case[1] | --- | 4.2 | ℃/W |

**Table 3. Electrical Characteristics (TJ=25℃unless otherwise noted)**

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **On/Off States** | | | | | | |
| BVDSS | Drain-Source Breakdown Voltage | VGS=0V ID=250μA | 100 | -- | -- | V |
| IDSS | Zero Gate Voltage Drain Current | VDS=100V,VGS=0V | -- | -- | 1 | μA |
| IGSS | Gate-Body Leakage Current | VGS=±20V,VDS=0V | -- | -- | ±100 | nA |
| VGS(th) | Gate Threshold Voltage | VDS=VGS,ID=250μA | 1.2 | 1.6 | 2.5 | V |
| RDS(on) | Drain-Source On-State Resistance | VGS=10V, ID=12A | -- | 16 | 20 | mΩ |
| | | VGS=4.5V, ID=8A | -- | 20 | 25 | mΩ |
| **Dynamic Characteristics** | | | | | | |
| Ciss | Input Capacitance | VDS=50V,VGS=0V, F=1MHZ | -- | 800 | -- | pF |
| Coss | Output Capacitance | | -- | 300 | -- | pF |
| Crss | Reverse Transfer Capacitance | | -- | 22 | -- | pF |
| Rg | Gate resistance | VGS=0V, VDS=0V,f=1.0MHz | -- | -- | -- | Ω |
| **Switching Times** | | | | | | |
| td(on) | Turn-on Delay Time | VGS=10V,VDS=50V, ID=1A,RGEN=6Ω | -- | 15 | -- | nS |
| tr | Turn-on Rise Time | | -- | 3.5 | -- | nS |
| td(off) | Turn-Off Delay Time | | -- | 30 | -- | nS |
| tf | Turn-Off Fall Time | | -- | 7.6 | -- | nS |
| Qg | Total Gate Charge | VGS=10V, VDS=50V, ID=8.5A | -- | 22.5 | -- | nC |
| Qgs | Gate-Source Charge | | -- | 5.5 | -- | nC |
| Qgd | Gate-Drain Charge | | -- | 15 | -- | nC |
| **Source-Drain Diode Characteristics** | | | | | | |
| ISD | Source-Drain Current(Body Diode) | | -- | -- | 40 | A |
| VSD | Forward on Voltage | VGS=0V,IS=12A | -- | -- | 1.0 | V |
| trr | Reverse Recovery Time | IF=12A , dI/dt=100A/μs , TJ=25℃ | -- | -- | -- | ns |
| Qrr | Reverse Recovery Charge | | -- | -- | -- | nc |

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25℃

# Typical Performance Characteristics

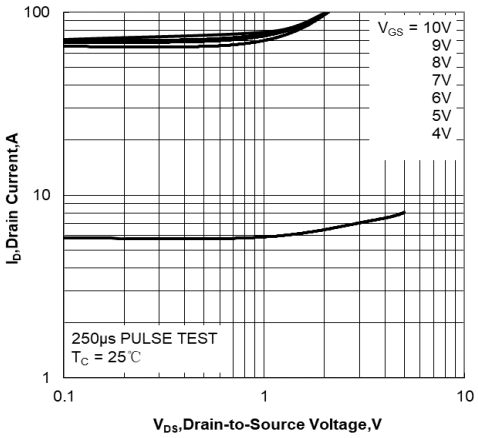



**Figure 1. Output Characteristics**

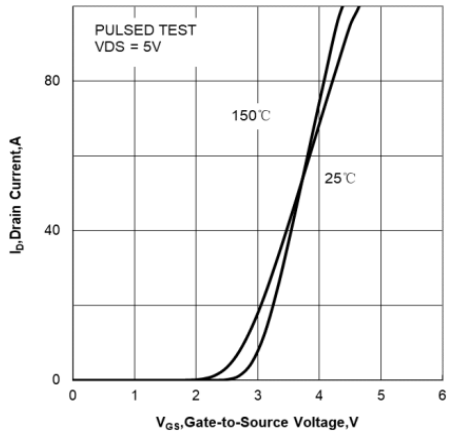



**Figure 2. Transfer Characteristics**

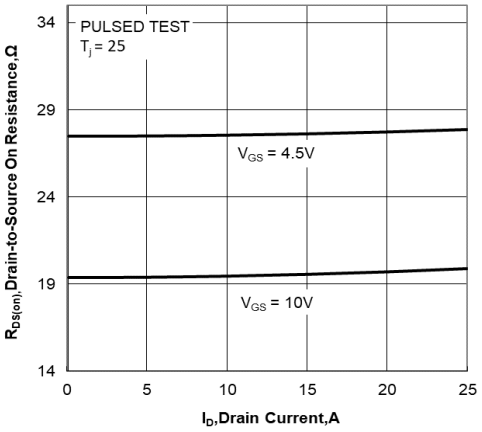



**Figure 3. Drain-to-Source On Resistance vs Drain Current**

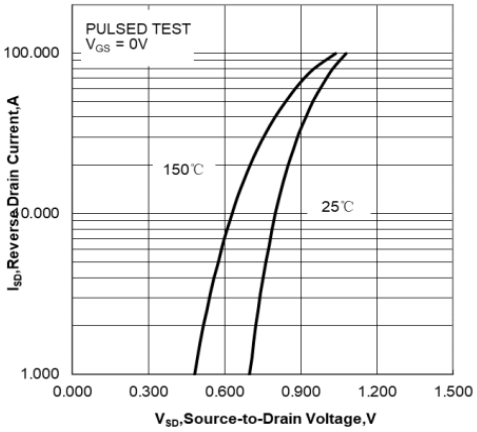



**Figure 4. Body Diode Forward Voltage vs Source Current and Temperature**

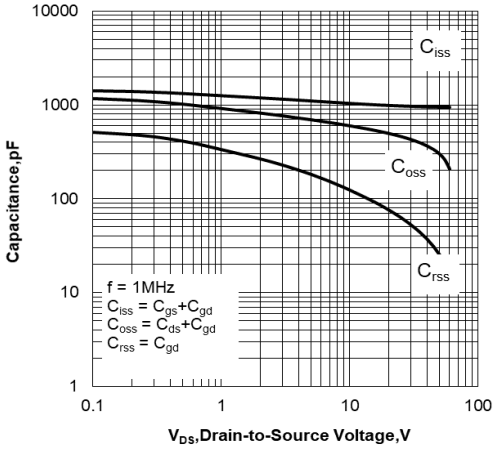



**Figure 5. Capacitance Characteristics**

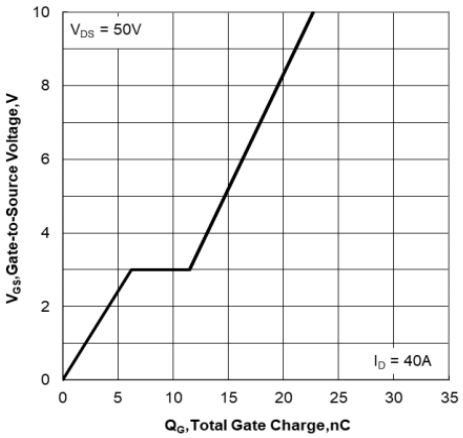



**Figure 6. Gate Charge Characteristics**

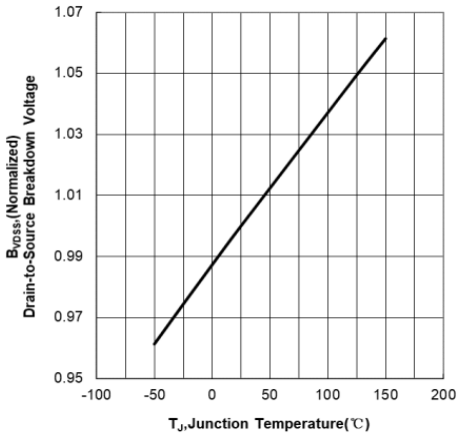



**Figure 7. Normalized Breakdown Voltage vs Junction Temperature**

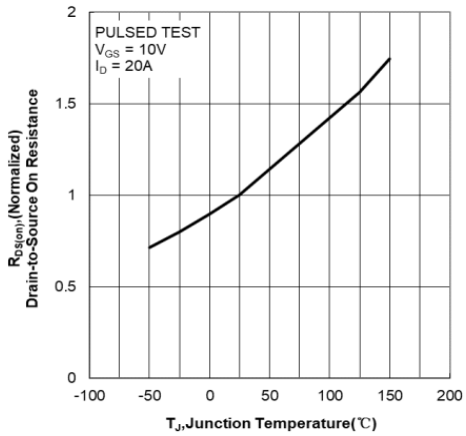



**Figure 8. Normalized On Resistance vs Junction Temperature**

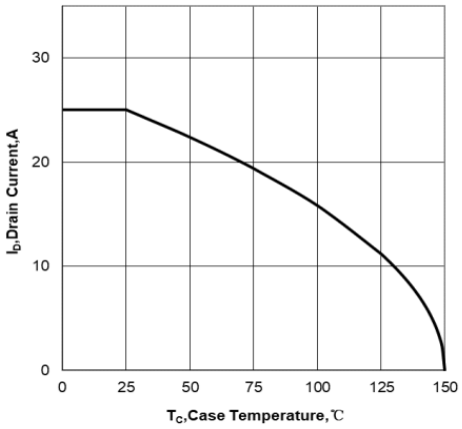



**Figure 9. Maximum Continuous Drain Current vs Case Temperature**

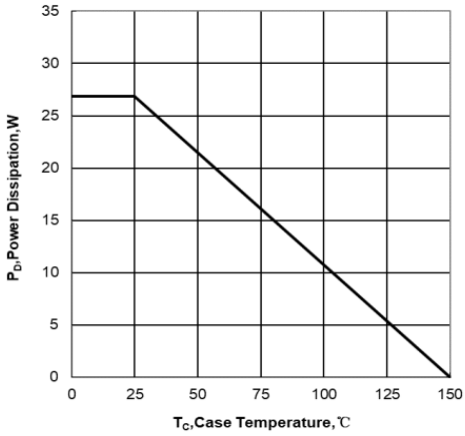



**Figure 10. Maximum Power Dissipation vs Case Temperature**

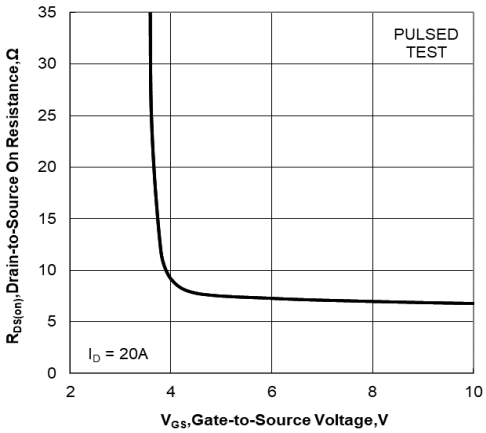



**Figure11. Drain-to-Source On Resistance vs Gate**

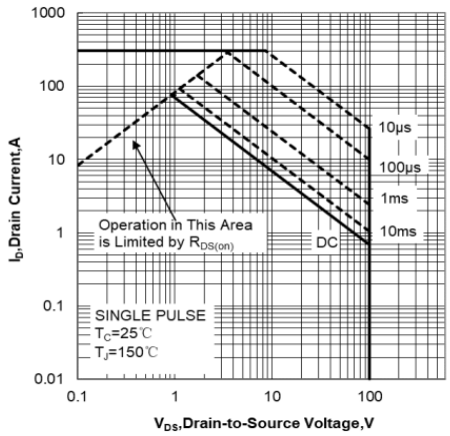



**Figure 12. Maximum Safe Operating Area**

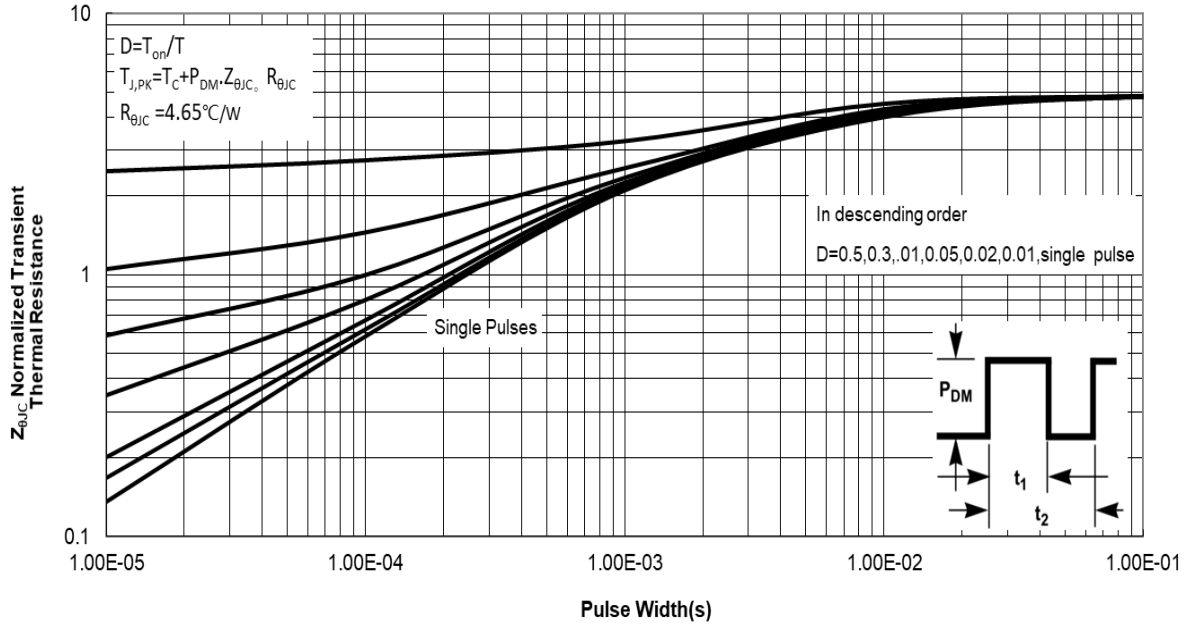
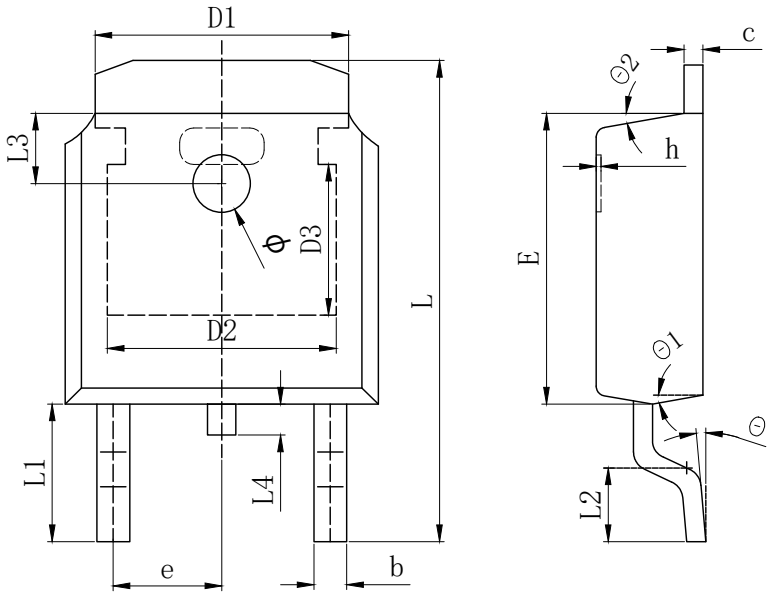
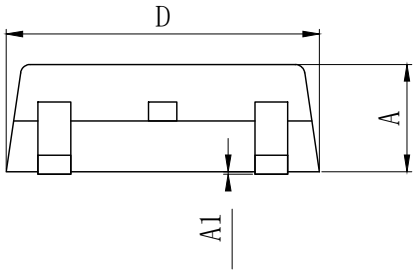
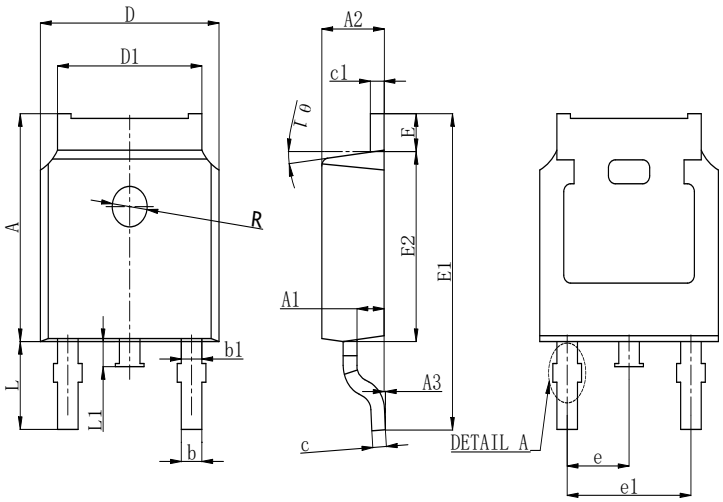


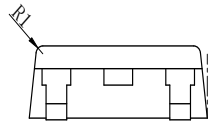

**Figure 13. Maximum Effective Transient Thermal Impedance, Junction-to-Case**

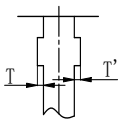
# TO-252 Package Outline Data




0<=T, T'<=0.12
DETAIL A

| SYMBOL | MILLIMETER | | |
|---|---|---|---|
| | MIN | Typ. | MAX |
| A | 2.200 | 2.300 | 2.400 |
| A1 | 0.000 | | 0.127 |
| b | 0.640 | 0.690 | 0.740 |
| c(电镀后) | 0.460 | 0.520 | 0.580 |
| D | 6.500 | 6.600 | 6.700 |
| D1 | 5.334 REF | | |
| D2 | 4.826 REF | | |
| D3 | 3.166 REF | | |
| E | 6.000 | 6.100 | 6.200 |
| e | 2.286 TYP | | |
| h | 0.000 | 0.100 | 0.200 |
| L | 9.900 | 10.100 | 10.300 |
| L1 | 2.888 REF | | |
| L2 | 1.400 | 1.550 | 1.700 |
| L3 | 1.600 REF | | |
| L4 | 0.600 | 0.800 | 1.000 |
| Φ | 1.100 | 1.200 | 1.300 |
| θ | 0° | | 8° |
| θ1 | 9° TYP | | |
| θ2 | 9° TYP | | |

| SYMBOL | MILLIMETER | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 7.050 | 7.100 | 7.150 |
| A1 | 0.960 | 1.010 | 1.060 |
| A2 | 2.250 | 2.300 | 2.350 |
| A3 | 0.000 | 0.050 | 0.100 |
| b | 0.760REF. | | |
| b1 | 1.000REF. | | |
| c | 0.508REF. | | |
| c1 | 0.508REF. | | |
| D | 6.550 | 6.600 | 6.650 |
| D1 | 5.220 | 5.320 | 5.420 |
| E | 0.950 | 1.000 | 1.050 |
| E1 | 9.700 | 9.900 | 10.100 |
| E2 | 6.050 | 6.100 | 6.150 |
| e | 2.286BSC | | |
| e1 | 4.572REF. | | |
| L | 2.650 | 2.800 | 2.950 |
| L1 | 0.700 | 0.800 | 0.900 |
| θ1 | 7° REF. | | |
| R | 1.300REF. | | |
| R1 | 0.250REF. | | |

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